

ABSTRACT OF THE DISCLOSURE

METHOD AND SYSTEM FOR POWER MANAGEMENT INCLUDING DEVICE
CONTROLLER-BASED DEVICE USE EVALUATION AND POWER-STATE CONTROL

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A method and system for power management including device controller-based device use evaluation and power-state control provides improved performance in a power-managed processing system. Per-device usage information is measured and evaluated during process execution and is retrieved from the device controller upon a context switch, so that upon reactivation of the process, the previous usage evaluation state can be restored. The device controller can then provide for per-process control of attached device power management states without intervention by the processor and without losing the historical evaluation state when a process is switched out. The device controller can control power-saving states of connected devices in conformity with the usage evaluation without processor intervention and across multiple process execution slices. The device controller may be a memory controller and the controlled devices memory modules or banks within modules if individual banks can be power-managed. Local thresholds provide the decision-making mechanism for each controlled device. The thresholds may be history-based, fixed or adaptive and are generally set initially by the operating system and may be updated by the memory controller adaptively or using historical collected usage evaluation counts or alternatively by the operating system via a system processor.